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OR,

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Scientific Notices.

Comprehending Notices of new Discoveries or Improvements in Science or Art; including, occasionally, singular Medical Cases; Astronomical, Mechanical, Philosophical, Botanical, Meteorological, and Mineralogical Phenomena, or singular Facts in Natural History, Vegetation, &c.; Antiquities, &c.

NOCTILUCA MARINA, OR LUMINOUS SEA INSECTS.

The luminous appearance of sea-water is a beautiful phenomenon, the cause of which has given rise to a great diversity of opinion. It has been ascribed to animalculæ, to electricity, and to phosphoric matter, originating in the decomposition of fishy matter.

It seems, however, to have been established by repeated experiments, that this light does proceed from an insect, although it has long been our opinion that electricity has something to do with the phenomenon, and we shall state our reason for that conclusion.

When salt water, which contains this luminous property, is agitated, the light is elicited; but if the agitation be continued without intermission, the light will cease to shine, which leads us to the conclusion that the cause of that light, be it what it may, has been excited to temporary exhaustion, as the light will re-appear after a short interval of rest. It is much the same with the light produced from the back of the cat, which will cease if the animal be rubbed for even a short time without intermission, but if the hand be removed, for awhile, the light will re-appear, when it is again applied.

Now, assuming that for fact, of which we entertain no doubt, viz., that the luminous appearance of sea water is caused by insects, and that the presence of electricity is an essential to the phenomenon, we have a pretty satisfactory reason for the light ceasing if the fluid be uninterruptedly agitated, as the electricity of the insect becomes temporarily exhausted, and requires an interval for its re-accumulation.

If we should be told that, in assuming the existence of these insects, we are begging the question, we shall proceed to assign the reasons for our belief.

The discovery of animalculæ in luminous sea water is too notorious to be doubted, whether the light be owing to the animalculæ or not. We shall select one experiment from a great number of the same nature.

Dr. Vianelli filtered a certain quantity of the luminous sea-water through a piece of linen, and perceived that the linen became luminous, and that the water lost that quality; but this was not all; for when he observed with a glass the small luminous points that were visible on the linen, he found that they were real sea insects, which shone when the water that contained them was set in motion. The Abbé Nollit and Dicqumare confirmed this fact by repeated experiments.

In the last number of the *Quarterly Journal*, there is a letter addressed to the editor, by a scientific gentleman of some celebrity, and as it seems to set this disputed point at rest, we shall here appropriate the whole, together with accurate representations of the insects from which the phenomenon is produced. —*Edit. Kal.*

Account of a Luminous Animalcule. By Capt. Home, R.N. F.R.S. &c. in a Letter to the Editor of the Quarterly Journal.

Hamburgh, Dec. 6, 1828.

MY DEAR SIR,—According to your desire I send you the following account:—Being at Lancing, on the coast of Sussex, in October, 1827, I considered it a good opportunity to examine into the cause of the light which I had often before observed so brilliant in the sea-weed thrown upon the beach.

It had blown hard from the south-west on the 8th, and three following days, and so great a quantity of weed had been thrown up, that the beach was covered with it to more than two feet deep in many places; it appeared for the most part to be of the same species. After it was dark, I collected a small quantity of the most brilliant, and found it always to be that which had been left at the first of the ebb, and was only moist, rather than that just washed up. This portion was taken into a dark room, where I picked out a single spark, the brightest that could be found, and carried it to the next room where there was a candle. After seeing the shape of the weed in my hand, I returned and picked off every thing, leaving that only on which the light appeared, keeping my eye on it through a common lens, till I was so near the candle as to lose the light upon the weed. In this manner I ascertained that it was produced by a minute body adhering to the sea-weed, which I am informed by Mr. Brown is *Sertularia volubilis* of Ellis (*Clytia volubilis* of Lamouroux.)

The light would remain steady sometimes for about five seconds, often less, and when it ceased, was renewed by touching it with the finger. I immediately made a sketch of it as it appeared in a small microscope I had carried with me.

I had still my doubts that what I had seen was the cause of the light; but was convinced of it after repeating the same observations for the five evenings I remained at Lancing.

Being anxious to examine these bodies in daylight, I entirely darkened a room, but was surprised to find they gave no light whatever; yet the same weed, kept till the evening, was as brilliant as any I had seen.

On my return to town, I brought with me a basket full of weed fresh that morning from the beach, and forwarded it the same evening to Mr. Bauer, who employed that and the three following evenings examining its contents. He has been so kind as to make a drawing of it, which will explain their appearance far more clearly than any thing that I can say. They are engraved and described by Ellis in the *Philosophical Transactions*, vol. lvii. and in his *Corallines and Zoophytes*; but as I have no where seen them described as luminous, I have ventured to give you this account, as it is interesting to you, and I am, my dear Sir, very truly yours,

EVERARD HOME.

The Bouquet.

"I have here only made a nosegay of culled flowers, and have brought nothing of my own but the thread that ties them."

THE FIELD OF WATERLOO.

We copy the following most painfully interesting narrative from a new work, edited by Military and Naval gentlemen, and entitled *The United Service Journal*:

Sunday morning was ushered in by one of the most dreadful tempests I ever remember. The crashing of thunder was followed by the roar of cannon, which was now distinctly heard from the ramparts, and it is not possible to describe the fearful effect of the apparent mockery of heaven. I never before felt so forcibly the feebleness of man. The rain was tremendous; the sky looked like that in Poussin's picture of the Deluge, and a heavy black cloud spread, like the wings of a monstrous vulture, over Brussels. The wounded continued to arrive the whole of Saturday night and Sunday morning, in a condition which defies description. They appeared to have been dragged for miles through oceans of mud; their clothes were torn,

their caps and feathers cut to pieces, and their shoes and boots trodden off. The accounts they brought were vague and disheartening—in fact, we could only ascertain that the Duke of Wellington had, late on Saturday, taken up his position at Waterloo, and that there he meant to wait the attack of the French. That this attack had commenced we needed not to be informed, as the roar of the cannon became every instant more distinct, till we even fancied that it shook the town. The wounded represented the field of battle as a perfect quagmire, and their appearance testified the truth of their assertions. About two o'clock a fresh alarm was excited by the horses, which had been put in requisition to draw the baggage waggons, being suddenly galloped through the town. We fancied this a proof of defeat, but the fact was simply this—the peasants, from whom the horses had been taken, finding the drivers of the waggons absent from their posts, seized the opportunity to cut the traces, and gallop off with their cattle.

As this explanation, however, was not given till the following day, we thought that all was over; the few British adherents who had remained were in despair, and tricoloured cockades were suspended from every house. Even I, for the first time, lost all courage, and my only consolation was the joy of Annette. "England cannot be much injured by the loss of a single battle," thought I; "and as for me, it is of little consequence whether I am a prisoner on parole, or a mere wanderer at pleasure. I may easily resign myself to my fate; but this poor girl would break her heart if she lost her lover, for he is every thing to her." In this manner I reasoned, but in spite of my affected philosophy, I could not divest myself of all natural feeling; and when, about six o'clock, we heard that the French had given way, and that the Prussians had eluded Grouché, and were rapidly advancing to the field, I quite forgot poor Annette, and thanked God with all my heart. At eight o'clock there was no longer any doubt of our success, for a battalion of troops marched into the town, and brought intelligence that the Duke of Wellington had gained a complete victory, and that the French were flying, closely pursued by the Prussians.

Sunday night was employed in enthusiastic rejoicing. The tricoloured cockades had all disappeared, and the British colours were hoisted from every window. The great bell of St. Gudule tolled, to announce the event to the surrounding neighbourhood; and some of the English, who had only hidden themselves, ventured to re-appear. The only alloy to the universal rapture which prevailed was the number of the wounded; the houses were insufficient to contain half; and the churches and public buildings were littered down with straw for their reception. The body of the Duke of Brunswick, who fell at Quatre Bras, was brought in on Saturday, and taken to the quarters he had occupied near the Chateau de Lacken. I was powerfully affected when I saw the corpse of one whom I had so lately marked as blooming with youth and health; but my eyes soon became accustomed to horrors.

On Monday morning, June 19, I hastened to the field of battle: I was compelled to go through the Forest de Soignés, for the road was so completely choked up as to be impassable; and I had not proceeded far before I stumbled over the dead body of a Frenchman, which was lying on its face amongst the grass. The corpse was so frightfully disfigured, and so smeared with mud and gore, that I felt horror-struck; but when, on advancing a little farther, I saw hundreds, and in less than an hour thousands of slain, I found my pity for individuals merge in the general mass, and the more I saw the less I felt; so true it is that habit reconciles us to every thing.

The dead required no help; but thousands of wounded, who could not help themselves, were in want of every thing; their features, swollen by the sun and rain, looked livid and bloated. One poor fellow had a ghastly wound across his lower lip, which gaped wide, and showed his teeth and gums, as though a second and unnatural mouth had opened below the first. Another, quite blind from a gash across his eyes, sat upright, gasping for breath, and murmuring, "De l'eau! de l'eau!" The anxiety for water was, indeed, most distressing. The German "Vaser! vaser! and the French "De l'eau! de l'eau!" still seem sounding in my ears. I am convinced that hundreds must have perished from thirst alone, and they had no hope of assistance, for even humane persons were afraid of approaching the scene of blood, lest they should be taken in requisition to bury the dead; almost every person who came near being pressed into that most disgusting and painful service.

This general burying was truly horrible; large square holes were dug about six feet deep, and thirty or forty fine young fellows, stripped to their skins, were thrown into each, pell mell, and then covered over in so slovenly a manner, that sometimes a hand or foot peeped through the earth. One of these holes was preparing as I passed, and the followers of the army were stripping the bodies before throwing them into it, whilst some Russian Jews were assisting in the spoliation of the dead, by chiseling out their teeth! an operation which they performed with the most brutal indifference. The clinking hammers of these wretches jarred horribly upon my ears, and mingled strangely with the occasional report of pistols, which seemed echoing each other at stated intervals, from different corners of the field. I could not divine the meaning of these shots, till I was informed that they proceeded from the Belgians, who were killing the wounded horses. Hundreds of these fine creatures were, indeed, galloping over the plain, kicking and plunging, apparently mad with pain, whilst the poor wounded wretches who saw them coming, and could not get out of the way, shrieked in agony, and tried to shrink back to escape from them, but in vain.

Soon after, I saw an immense horse (one of the Scotch Greys) dash towards a Colonel of the Imperial Guard, who had had his legs shattered; the horse was frightfully wounded, and part of a broken lance still rankled in one of its wounds. It rushed, snorting and plunging, past the Frenchman, and I shall never forget his piercing cry as it approached. I flew instantly to the spot, but ere I reached it the man was dead; for, though I do not think the horse had touched him, the terror he felt had been too much for his exhausted frame.

Sickened with the immense heaps of slain, which spread in all directions as far as the eye could reach, I was preparing to return, when, as I was striding over the dead and dying, and meditating on the horrors of war, my attention was attracted by a young Frenchman, who was lying on his back, apparently at the last gasp. There was something in his countenance which interested me, and I fancied, though I knew not when, or where, that I had seen him before. Some open letters were lying around, and one was yet grasped in his hand as though he had been reading it to the last moment. My eye fell upon the words "*Mon cher fils*," in a female hand, and I felt interested for the fate of so affectionate a son.

When I left home in the morning, I had put a flask of brandy, and some biscuit into my pocket, in the hope that I might be useful to the wounded, but when I gazed on the countless multitudes which strewed the field, I felt discouraged from attempting to relieve them. Chance had now directed my attention to one individual, and I was resolved to try to save his life. His thigh was broken, and he was badly wounded on the left wrist, but the vital parts were untouched, and his exhaustion seemed to arise principally from loss of blood.

I poured a few drops of brandy into his mouth, and crumbling my biscuit, contrived to make him swallow a small particle. The effects of the dose were soon visible; his eyes half opened, and a faint tinge of colour spread over his cheek. I administered a little more, and it revived him so much that he tried to sit upright. I raised him, and contriving to place him in such a manner as to support him against the dead body of a horse, I put the flask and biscuit by his side, and departed in order to procure assistance to remove him.

I recollected, that a short time before I had seen a smoke issuing from a deep ditch, and that my olfactory nerves had been saluted by a savoury smell as I passed. Guided by these indications, I retraced my steps to the spot, and found some Scotch soldiers sheltered by a hedge, very agreeably employed in cooking a quantity of beef-steaks over a wood fire, in a French cuirass! I was exceedingly diverted at this novel kind of frying pan, which served also as a dish; and after begging permission to dip a biscuit in their gravy for the benefit of my patient, I told my tale, and was gratified by the eagerness which they manifested to assist me; one ran to catch a horse with a soft Hussar saddle (there were hundreds galloping over the field,) and the rest went with me to the youth, whom we found surprisingly recovered, though he was still unable to speak. The horse was brought, and as we raised the young Frenchman to put him upon it, his vest opened, and his "livret" fell out. This is a little book which every French soldier is obliged to carry, and which contains an account of his name, age, pay, accoutrements, and services. I picked it up, and offered it to my patient—but the young man murmured the name of "Annette," and fainted.

Fine Arts.

THE LONDON COLOSSEUM.

(From the British Traveller.)

This singular, ingenious, and magnificent place of national amusement was opened last Saturday week, by its liberal proprietor, to a few literary gentlemen, and other persons eminent in science or the arts. We were favoured with this private admission, and we are happy to say that what is already finished is sufficient to gratify the public, and to convince the scientific and curious of results exceeding any thing which ingenuity had ever contrived. We personally know that this grand design has been much canvassed abroad, even to the distance of Berlin and St. Petersburgh. Had such a work been undertaken on the Continent, it would have been the result of a combination of capitalists, aided covertly by ministers, or ostentatiously by Government; but in England, this, like all other works of splendour and utility, is the produce of individual genius, enterprise, and exertions. The work is sufficiently advanced to indicate its splendid success, and, consequently, to command the aid of capitalists, and the patronage of every class. The permanent impression is that of wonder, if not of incredulity, of such multiplied and varied effects being produced, in comparatively so small a space. Every illusion which optics can produce, which taste can imagine, and the principles of the picturesque and beautiful can effect, will be here witnessed in delightful and almost infinite variety. The whole of these may be described under three classes—the panorama, with its machinery and collateral ornaments and devices; the subscription-rooms; and last, though not least, the grounds thrown open to the public. We will begin at the subscription-rooms. To these you must ascend by a flight of steps, or over a rising ground, thickly planted with evergreens, in which we observe the old system of studying the effect of different tinges of the foliage has been attended to, as much as this class of plant admits of. The first object is a semicircular rustic viranda, overhung with ivy, forming Gothic arches. This leads into a spacious reading or lounging room, to be fitted up in the style of a Turkish Kiosk, or summer-house. Out of this run several long rooms, or vestibules of communication, leading to the grand library, of spacious dimensions, and of proportions that strike us as remarkably good. Deep recesses filled with books, and with immense windows of plate glass, which produce a variety of lights and shades, and of splendid objects. These, with a few other apartments of great extent and variously fitted, are for the use equally of male and female subscribers. We believe each subscriber will have the privilege of introducing two ladies. Here a staircase leads to a suite of apartments for the ladies only, whilst the floor underneath will be appropriated to the gentlemen. Here will be a number of lounging-rooms, studies, dining halls, refectories, &c. It is a feature of the whole of the design that it possesses capabilities of almost infinite adaptions to what may be found the taste or wishes of the public, or to what future ingenuity may devise. This whole department, however, is exceeded by the division intended for the non-subscribers:

the enchantment here is totally of another class. Room succeeds room, and avenue leads to avenue, forming beautiful vistas between exotics and native shrubbery, artfully reflected by almost countless mirrors. At length you enter a long conservatory, entirely of glass, with rich and massive clusters of creeping and twining plants, and every species of shrub and flower. In the centre there is a magnificent shrubbery, consisting of thirty-five distinct species of the Camellia Japonica. Some of the specimens are truly beautiful, and will gratify the most experienced botanist. This avenue introduces you to what we suppose we must call the Glass Saloon, the large dome of which can be seen from the Regent's Park. This is likewise to be ornamented with shrubbery and flowers, and an alcove running from it is to be filled with birds, either of the richest plumage, or of the choicest note. In the centre of this saloon is a reservoir of ornamental water, in which there is to be an hydraulic contrivance, much smaller, of course, than the fountain and water-works of Versailles, but exceeding them in ingenuity of design and beauty of effect. The fountain is ornamented with the figure of a water nymph. The central column of water is thrown among a body of flowers, pendant from the dome, and falls in rills from the circumference to the reservoir, which is of white marble.—The next attraction is a Swiss Cottage, fitted in the taste which we may call the Rustic Gothic. But the perfection is, the view from these windows; they look upon a large arch of rock and rusticated stone, which leads to a grotto. In the back ground are three cascades, falling into a cave or pool from the height of sixty feet. What struck us as surprising is, that although the arch, the grotto, the cascades, and numerous other objects are seen from these windows, contained in so small a space, nothing appears small or artificial; and, we know not how it can be contrived, but, from no point of view do you see the Colosseum itself, though this pile of building is within a hundred yards of you, or less. We forgot to mention that in one of those verdant avenues there is a Gothic lantern in the roof, in which there is an optical contrivance of a kaleidoscope.

We now come to the Panorama.—On entering under the great dome, you may either ascend by a flight of stairs, or may be introduced to a circular chamber, which will contain about thirty persons. This room is then raised, imperceptibly, by machinery, to the height of the building, when stepping through a small door, to your astonishment, you find yourself apparently on the top of St. Paul's, the dome and cupola being immediately beneath your feet, the freshness of the air surrounding you, whilst the magnificent Panorama of London and its extensive environs strikes upon the astonished vision—nothing can exceed the effect. The spectator, as soon as he has recovered from his surprise, and can withdraw his attention from the immense area of space, and the perspective around him, is again astonished at the distinctness with which he can view every street and building, and almost every individual house. The area of canvas, we are told, would cover an acre and a half of ground; and being admitted to a close inspection, we were surprised at the elaborate finish of even the windows and blinds, and smaller minutiæ of the houses. The whole exceeds description.—It shows not merely every principal street in the city, and every public edifice, but some section or portion of every house, unless of those which are so completely concealed by higher buildings round as to be accessible to nothing short of a directly vertical view; and beyond this, in the back ground of the picture, extends a prospect of the whole country surrounding the metropolis; embracing all the leading objects, in some directions, to an extent exceeding thirty miles. This picture has been the chief cause of the length of time which has already been occupied in the undertaking. From its great extent, and the vast number of objects contained in it, added to the mathematical precision with which it was necessary to the inventor's purpose that every point should be executed, it has been found necessary absolutely to educate most of the artists who are employed. The architectural painters of skill or eminence, accustomed to paint in oil colour, are not numerous; and of these many become speedily disheartened by the great magnitude and slow progress of the work, jealous to the troublesome accuracy, both of design and colouring, necessary to its performance; while others, of considerable talent as landscape and scene painters, have been found (from the different character of the works to which they were accustomed) incompetent to the task. Some idea may be formed of the scale upon which the design proceeds, from the fact that one single building represented (the New Postoffice) contains near 300 square feet of painting, and this whole executed with such exactness, that not a frieze, or even the plinth of a column, is omitted. You may ascend still higher, and view the identical copper ball which Sir Christopher Wren originally placed on the top of St. Paul's. It is curious to see the effect of the atmosphere of London on the metal placed at such an immense height for more that a century. But scarcely less an object of interest is the Robinson Crusoe-like hut which Mr. Hornor, a few years ago, contrived to erect round this ball, when on the top of the Cathedral, and in which he lived so many days suspended mid way between earth and heaven, intent upon his task, by which he has produced the astonishing panorama now before us. By the bye, we must here do a service to our fair readers, by warning them of the curious whispering bridge, or echo gallery. Here you are inaudible to those around you, whilst all you say is reverberated by about twenty echoes, and is heard in all directions around the spacious building. We would advise choleric old gentlemen to abstain from their pshaws, or zounds, or oaths; and fat old ladies not to mount the stairs too quickly, and indulge in anhelations, vulgarly called puffing. Thin ladies must not whine and sigh out their "Oh, dear me's." Papas must not be objurgatory; and young ladies and gentlemen, if they think soft things, must express them by the eyes, and not by the tongue, for every vibration of this organ will be echoed to the very echo, which will re-echo it o'er and o'er again. The Tower of Babel was nothing to this. Only think of the effect of a thousand pshaws, as many zounds, some few oaths of anger, vows of love, bluff scoldings, petulant whinings, and ten thousand silly compliments popping like pistol balls in every direction round your astonished ears, not a person being seen from whom the sounds proceed. The unfreezing of the words in Nova Zembla, was not to be compared to it. On a gallery over this ball and cross, the spectator has a still higher bird's-eye view of the panorama. Immediately above this is the outer gallery, over the dome seen from the Park, from which, in summer, persons may inhale the pure breezes of the fields in lieu of the smoke of the streets; where it is no longer a picture which is before him, but a living panorama of the whole west and north ends of London; with the Regent's Park, the whole of the new improvements, &c. immediately under him; and the hills of Highgate and Hampstead one way, and St. Paul's and Westminster Abbey the other, in the distance; this feature alone forming an exhibition which thousands of persons in the metropolis would be content to pay a consideration to see. There is an immensely large circular pavilion fitting up in the Oriental style, the outer lines of the galleries we have described, forming, in appearance, a sort of pagoda. The whole exhibition is dissimilar to any thing in Europe, and we have no doubt will be a principal attraction to foreigners visiting London.

The panorama opens to the public on Wednesday, for one exhibition, in which parties will be admitted by tickets, at a guinea for four persons. Few will miss the opportunity of witnessing this singular place of amusement, and it will be extremely curious to compare its finished state with its present condition. We believe Wednesday will be the only day in which the public will be let behind the scenes (if we may so speak,) and witness the arcana of the scientific and artificial contrivances by which will be produced a succession of magnificent illusions, and scenes of beauty, surpassing what imagination has painted in Caliph Vathek, or in the most gorgeous scenery of any Oriental fiction.

Scientific Notices.

CHEMISTRY.—OXYGEN.

(Continued from page 211.)

OXYGEN GAS.

This most important agent in nature was first discovered by that accomplished scholar and eminent philosopher, the celebrated Dr. Priestley. Its base is very abundant in nature, constituting about one-fifth of our atmosphere, the other four-fifths being nitrogen. Water is constituted of seventy-five parts of it, and twenty-five parts of hydrogen, in the hundred. It exists in most vegetable and animal products, acids, salts, and metallic oxides. It has neither smell nor taste; and its specific gravity is only a little more than common air—one hundred cubic inches weigh thirty-three grains, common air thirty-one. Its presence is absolutely essential to the support of animal life. It is, likewise, a powerful supporter of combustion. Any inflammable substance introduced into it burns rapidly and vividly. It may be obtained from various substances;—from red lead, nitrate of potash, (saltpetre,) red oxide of mercury, and black oxide of manganese: on putting an ounce or two of powdered manganese into a gun-barrel, closed at one end, and having a lead pipe fitted to the other, on introducing the end of the barrel containing the manganese into the fire, and tying an empty bladder to the end of the lead pipe, as the heat increases, oxygen gas will be given out in great abundance from the manganese and fill the bladder,—from which it may be easily transmitted into a bottle, or glass, of any form; by filling the bottle with water, and turning its mouth downwards into a basin of water, having previously inserted a small bent tube into the neck of the bladder, which being introduced into the mouth of the bottle, under water,—on pressing the bladder, the gas will ascend, and displace the water; and on removing the bottle, we have it then full of oxygen; and on introducing any lighted substance into it, it will burn with great brilliancy and splendour. If we introduce a piece of steel-wire, coiled in a spiral form, with a bit of lighted touchwood, charcoal, or a thread of cotton dipt in wax, the wire will burn with a beautiful bright light, and throw out a number of brilliant sparks. If we introduce a taper that has previously been lighted, and then blown out, it will immediately rekindle with an explosion, and may be blown out and rekindled at pleasure, until the whole oxygen is exhausted; it will then no longer rekindle.

Oxygen, when combined indifferently with the same substance, imparts to it extremely different properties.

1. Twenty parts oxygen and eighty parts nitrogen form atmospheric air, which is destitute of smell or taste, and is respirable.

2. Two volumes and a half of oxygen united to one of nitrogen, constitute nitric acid gas, an acid highly corrosive, and destructive of animal life.

3. One part of oxygen to two of nitrogen, form a gas possessed of very extraordinary properties in its action in the human body when respired, producing highly pleasureable sensations, resembling those of the most pleasant period of intoxication; it is usually called laughing gas.

The combinations of oxygen are called oxides, and are commonly designated by their colours, such as red, white, black, &c. particularly in its combination with the metals. Red lead is an oxide of lead (the red,) the scales of iron from a smith's anvil are a black oxide of that metal, &c. The term oxide is applied in all cases where the oxygen is not in sufficient quantity to make the compound acid.

HYDROGEN GAS.

Hydrogen was first discovered by Mr. Cavendish; it is the lightest body that can be weighed, its specific gravity being to common air, as 1 to 15. One hundred inches only weigh two grains.

1. It is colourless, and possesses all the physical properties of common air.

2. If a lighted taper be plunged into it, it will be extinguished, and the gas will burn at the surface in contact with the air.

3. Although it extinguishes combustion, yet it is of itself one of the most combustible of all substances, forming the basis of all flame.

4. It is irrespirable, animal life being speedily extinguished by it.

5. It is easily procured by putting into a glass bottle a quantity of iron filings, and pouring on them sulphuric acid, diluted with five or six times its weight of water; a violent effervescence ensues; the water is decomposed, its oxygen uniting with the iron, and its hydrogen being liberated, escapes.

6. On fixing, by means of a cork, a piece of a tobacco-pipe into the mouth of the bottle, the hydrogen escaping from the small orifice may be set fire to, and will continue to burn with a lambent bluish flame so long as the hydrogen is evolved. Caution must be used not to set fire to it until certain that the whole of the common air has been expelled from the bottle, otherwise a dangerous explosion will take place. This has been called Priestley's Philosophical Candle.

7. If to two volumes of hydrogen we add one volume of oxygen, and set fire to the mixture, a violent explosion ensues, and the whole is resolved into a portion of water, equivalent in weight to the weight of the two gases employed.

(To be continued.)

Tide Table.

Days.	Morn.	Even.	Height.		Festivals, &c.
	h. m.	h. m.	ft.	in.	
Tuesday ..20	11 28	11 44	16	7	Full Moon, 0h. 4m. morn.
Wednesday21	——	0 1	16	11	Agnes.
Thursday 22	0 17	0 32	16	11	Vincent.
Friday 23	0 49	1 5	16	10	Hilary Term begins.
Saturday..24	1 22	1 38	16	5	[Con. of St. Paul.
Sunday....25	1 54	2 10	15	9	3d Sunday after Epiphany.
Monday ..26	2 28	2 46	14	11	
Tuesday ..27	3 6	3 26	13	10	Duke of Sussex born.

Poetry.

STANZAS ON THE EXECUTION MILITAIRE.

A Print from a Picture by Vigneron.

It exhibits the moment when the condemned soldier kneels to receive the fire of the party appointed to be his executioners. His dog, whom he is endeavouring to shake off, still fawns upon him, and seems desirous to share his fate.

Away, away! thou faithful one,
Nor court thy master's fate,
For friends and kindred all are gone,
The flatterer and ingrate;
And none in this cold world save thou,
Not one is near to aid me now.

Away, fond lingerer, away!
Unconscious of my doom,
Thou little dream'st that parting day
Will glimmer on my tomb;
That I, this hour, my life must yield,
Ignobly, on a bloodless field.

Away, away! and seek the home
I never more shall see,
For there, though all around be gloom,
Are those will shelter thee;
Warm hearts, that ready now to break,
Will cherish thee, for Henry's sake.

My mother! oh, to her wrung heart,
How dread this fatal hour!
Cold drops upon her forehead start,
Aid her, almighty Power:
My father! to the grave I see
My father borne,—oh, God! by *me*.

Level your guns, companions, friends!
And merciful the ball
The spirit's agony that ends,
And speeds the wanderer's fall;
But thou, too generous one, away,
Thou wert not wont to disobey.

Away! and here no longer stay,
This is no place for thee;
And, comrade, when has past way
This dread solemnity,
Say, wilt thou, then, when I am gone,
Give shelter to my friendless one?

And wilt thou to my far off home
My loving follower bear;
The only relic of the tomb,
That clung to me e'en there?
I know thou wilt;—and, now away,
No longer here, fond lingerer, stay.

Liverpool. C.

TWENTY-EIGHT AND TWENTY-NINE.

[*From the New Monthly Magazine.*]

I heard a sick man's dying sigh,
And an infant's idle laughter;
The old Year went with mourning by,
The new came dancing after:
Let Sorrow shed her lonely tear,
Let Revelry hold her ladle;
Bring boughs of cypress for the bier,
Fling roses on the cradle:
Mutes to wait on the funeral state!
Pages to pour the wine!
And a requiem for Twenty-eight,—
And a health to Twenty-nine.

Alas! for human happiness,
Alas! for human sorrow;
Our yesterday is nothingness,
What else will be our morrow?
Still beauty must be stealing hearts,
And knavery stealing purses;
Still cooks must live by making tarts,
And wits by making verses;
While sages prate and courts debate,
The same stars set and shine;
And the world, as it roll'd through Twenty-eight,
Must roll through Twenty-nine.

Some king will come, in Heaven's good time,
To the tomb his father came to;
Some thief will wade through blood and crime
To a crown he has no claim to:
Some suffering land will rend in twain
The manacles that bound her,
And gather the links of the broken chain
To fasten them proudly round her:
The grand and great will love, and hate,
And combat, and combine;
And much where we were in Twenty-eight,
We shall be in Twenty-nine.

O'Connell will toil to raise the rent,
And Kenyon to sink the nation;
And Shiel will abuse the Parliament,
And Peel the Association:
And the thought of bayonets and swords
Will make Ex-Chancellors merry;
And jokes will be cut in the House of Lords,
And throats in the county Kerry:
And writers of weight will speculate
On the Cabinet's design;
And just what it did in Twenty-eight,
It will do in Twenty-nine.

Mathews will be extremely gay,
And Hook extremely dirty;
And brick and mortar still will say,
"Try Warren, No. 30:"
And "General Sauce" will have its puff,
And so will General Jackson;
And peasants will drink up heavy stuff,
Which they pay a heavy tax on:
And long and late, at many a fête,
Gooseberry champagne will shine;
And as old as it was in Twenty-eight,
It will be in Twenty-nine.

And the Goddess of Love will keep her smiles,
And the God of cups his orgies;
And there'll be riots in St. Giles,
And weddings in St. George's;
And mendicants will sup like kings,
And lords will swear like lacqueys;
And black eyes oft will lead to rings,
And rings will lead to black eyes:
And pretty Kate will scold her mate,
In a dialect all divine;
Alas! they married in Twenty-eight,—
They will part in Twenty-nine!

John Thomas Mugg, on a lonely hill,
Will do a deed of mystery!
The *Morning Chronicle* will fill
Five columns with the history:
The jury will be all surprise,
The prisoner quite collected;
And Justice Park will wipe his eyes,
And be very much affected:
And folks will relate poor Corder's fate,
As they hurry home to dine,
Comparing the hangings of Twenty-eight
With the hangings of Twenty-nine.

A curate will go from the house of prayer
To wrong his worthy neighbour,
By dint of quoting the texts of Blair,
And singing the songs of Weber;
Sir Harry will leave the Craven hounds,
To trace the guilty parties;
And ask of the court five thousand pounds,
To prove how rack'd his heart is:
An advocate will execrate
The spoiler of Hymen's shrine;
And the speech that did for Twenty-eight
Will do for Twenty-nine.

My uncle will swathe his gouty limbs,
And tell of his oils and blubbers;
My aunt, Miss Dobbs, will play longer hymns,
And rather longer rubbers:
My cousin in Parliament will prove
How utterly ruin'd trade is;
My brother at Eton will fall in love
With half a hundred ladies:
My patron will sate his pride from plate,
And his thirst from the Bordeaux vine;
His nose was red in Twenty-eight,
'Twill be redder in Twenty-nine!

And oh! I shall find, how, day by day,
All thoughts and things look older;
How the laugh of pleasure grows less gay,
And the heart of friendship colder:
But still I shall be what I have been,
Sworn foe to Lady Reason,
And seldom troubled with the spleen,
And fond of talking treason:
I shall buckle my skait, and leap my gate,
And throw and write my line;
And the woman I worshipped in Twenty-eight,
I shall worship in Twenty-nine!

Diorama, Bold-street.

This EXHIBITION is NOW OPEN, with a VIEW of the INTERIOR of ROSLIN CHAPEL, but will

SHORTLY BE REMOVED.

This Picture joins to the optical illusion so wonderful in all the Works of Messrs. BOUTON and DAGUERRE, the most beautiful effect of *Passing Sunshine*—an effect so admirably executed that it has excited the wonder and admiration not only of an extraordinary large portion of the Public in Paris and London, but of the principal Artists of both Capitals, who have unanimously pronounced it the most astonishing production of the Pencil ever witnessed.

☞ Open from Ten till Dusk.

Admission: Front Seats, 2s.; Gallery, 1s.; Children under Twelve Years of Age, Half price.

Perpetual Tickets for the Season, 5s. each.

CHRISTMAS.

The feelings attendant upon old customs last much longer than the customs themselves. Though the May-pole is nowhere to be seen hung round with garlands, and the Queen of Spring's own peculiar and brightest day has been deposed for more than a century, May Morning rises on no village of the kingdom without meeting many a May Queen, or groups of free happy beings as ready as our ancestors ever were to pay their homage to the pure and glorious young Summer. Valentine's Day, too, the festival of the goodnatured Saint Valentine, scorned as it is by our modern fashionables, has not, we are confident, one faithful observer less than formerly, though sending out ribbons, and sweetmeats, and love-verses has been long exploded, and nothing but cuckoos and sparrows may openly say "Good-morrow, Valentine!" And April Day, again, on which it would be thought, in these philosophic times, monstrous to laugh more than on any other, we would venture to say it is mere unnatural fashion, a downright violence upon the tendencies of a goodnatured, humane humour, and no addition of seriousness, which keeps every face so sober on this folly-loving day.

But there are changes, or rather an annihilation of customs and fashions, which, we are half inclined to think, were worth more than the philosophy which has shunned them out of the world. The hilarity which told its existence by the gay idle little observances we have already mentioned, was once as well known and manifest as the joy of young birds by their singing. We have no idea so gloomy, as to make us think there is less readiness in our English nature to be merry than in other ages, but we have lost much by having no longer those conventional signs of national good temper, and those fixed days of jollity to which one kind heart might look forward with a cheery feeling, from knowing it would find a thousand more as happy and ready to laugh as itself. But we can find a weightier reflection for the changes which have taken place in the manner of keeping Christmas festivities. It is no good sign of the times, as far as churchmen are concerned, that there is scarcely one old venerable day in the calendar which priest or deacon would tie on his band to celebrate. Now, as we shall never be suspected of wishing to defend old palsied Superstition, with her cumbrous scarlet garment, we should have no dislike to see the men who talk much about their reverence for antiquity, keep up her grand and solemn forms, her consecrated jubilees, and her feasts of music and praise, poured out from hearts overflowing with joy and deep holy thoughts.—Christmas is still kept as religiously, in one respect, as it ever was; for neither churchman, nor feast-hating Dis-

sonter, lets it pass without making it as grand a festival as eating or drinking can make it. There is not a whit more of spirituality introduced by the diminution of the olden customs. There can never be a popular Quakerism; and if people be taught to despise the observances of a religious festival, the only consequence will be, that they will keep the feast, and forget the religion of it altogether. This has been the case with respect to Christmas. There was a time when its return was the signal for healing all wounds in the good-fellowship of friends and neighbours; when the rudest of the people would listen with melting hearts to the simple chant and carol that heralded in the sacred morning; when the green holly-bush, with its blood-red berries peeping out of the snowy hedge, was an emblem of holy things to every eye; and when the church-bells and the organ-music, and the pealing anthem were necessary parts of the festival. The huge fire, the cheerful bowl, the merry evening song, the quips and cranks of light hearts, were more joyous than now, and it was so because there was a deeper glow of feeling, more of heart and soul in the attendance on the festival. Men thought of things that make life's happiness surer, and the love of father and child sweeter, because more far-stretching. There was a rich tracery of solemn associations and divine hopes, making each little homely banquet-room like an inner chamber in the temple of domestic love; and the laugh and song, and all the merry contrivances of youth, were a demonstration of the peace and the happy thoughts that had taken complete possession of all bosoms. But we have lost much of the true character of Christmas merry-makers, and have gained nothing in return. There is more of rude intoxication than ever: we meet reeling drunkards, where, a century back, they would have been afraid to show their face; and the cold fashionable dinner-party eat and drink their fill without one tittle of the charity or the joyousness which once made the day sacred to hospitality.—*London Weekly Review.*

The Fireside.

"In order to employ one part of this life in serious and important occupations, it is necessary to spend another in mere amusements."—JOHN LOCKE.

"There is a time to laugh and a time to weep."—SOLOMON.

No. V.

VIVENT LES BAGATELLES!

(Continued from our last.)

SOLUTIONS TO CONUNDRUMS, &c. IN OUR LAST.

40. Because he has for some time past been labouring in his vocation in Greece (grease.)
41. Because he must brush.
42. Flag.
43. Because they are prest on (Preston.)
44. Because it will be bad "*Times*" with them.
45. Because it is all sixes and sevens with them (67th.)
46. Wavertree.
47. Cobbett.
48. $6\times6\times6=216$
$3\times3\times3\times2=54$
162 due.
49. Half of pullet (pul) and pit (pulpit.)
50. The letter C.
51. Donkey.
52. The letter T.

NEW CONUNDRUMS, &c.

Good, indifferent, bad, and shocking.

53. Why does the Liverpool Gymnasium now present a most extraordinary spectacle in natural history?
54. My first is sometimes committed, my second is sometimes permitted, and my whole cannot be resisted.
55. If I was in the sun and U out of the sun, what would the sun be?
56. What am I?
57. Why is Sir John Moore like eternity?
58. Why is a person in bed like fivepence three farthings?
59. Why is portable soup like Easter?
60. My first is nauseous, my second mean, and my whole soothing.
61. I know a word of letters three,
By adding two there'll fewer be.
62. What is invisible, yet never out of sight?
63. What increases the effect by diminishing the cause?
64. What burns to keep a secret?
65. What is that which belongs entirely to yourself, yet is chiefly used by others?
66. Which was the animal that went last into the ark?
67. What was that which was in the world without life, yet it had life, and its being was frightful to man; it became lifeless and inoffensive, yet again it had life, and devoured every thing it saw like itself?
68. Enfant de l'art et de la nature,
Sans prolonger la vie, j'empêche de mourir;
Plus je suis vrai plus je suis imposteur,
Et je deviens trop jeune à force de vieillir.
69. Ce que vous m'êtes, ce que je voudrois vous être, et ce que je vous fais faire.
70. Why is the inscription generally found in confectioners' shops, of "Water-ices and ice-creams," like a person attacked with the hydrophobia?

A shining wit pronounced, of late,
That every acting magistrate
Was water in a freezing state.

Another wit said, in reply,
That, certainly, what heralds cry
Exactly was the contrary.

The Beauties of Chess.

"Ludimus effigiem belli."—VIDA.

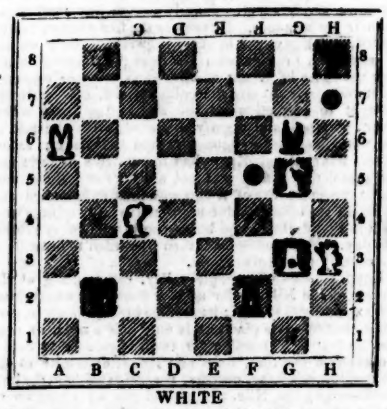
SOLUTION TO STUDY CCIII.

WHITE.	BLACK.
1 Castle .....C—8✕	1 King.....D—7
2 Knight .....B—8✕	2 King.....D—6
3 Castle .....C—6✕	3 King.....D—5
4 Knight .....C—3✕	4 King—.....D—4
5 Castle .....D—3✕	5 Knight.....D—3
6 Bishop .....E—3✕	6 Queen .....E—3✕
7 Pawn ... E—3✕	MATE.

SITUATION FOR STUDY CCIV.

White to move and win in seven moves.

Black.



WHITE

METEOROLOGICAL DIARY.

[From the Liverpool Courier.]

Barometer at noon.		Extreme during Night.		Thermometer 6 morning		Extreme heat during Day.		State of the Wind at noon.	Remarks at noon.
Jan.									
7	29	92	30	0	35	0	38	0	E.N.E.	Cloudy.
8	29	73	31	0	34	0	38	0	E.N.E.	Fair.
9	29	64	31	0	35	0	37	0	N.N.E.	Cloudy.
10	29	57	33	0	36	0	39	0	E.N.E.	Fair.
11	29	70	34	0	34	0	38	0	E.S.E.	Cloudy.
12	29	90	30	0	34	0	39	0	N.	Cloudy.
13	30	10	34	0	37	0	40	0	N.E.	Cloudy.

7th,—Five, p.m. slight fall of snow.

The Investigator.

[Comprehending Politics Economy, Statistics, Jurisprudence, occasional passages from Parliamentary Speeches of a general nature, occasional Parliamentary Documents, and other speculative subjects, excluding Party Politics.]

MR. BUCKINGHAMS' LECTURES ON THE ANTIQUITIES RESOURCES, MANNERS, CUSTOMS, &c. &c. OF THE EASTERN WORLD.

"Whether it be for the interests of the nation at large, that the most valuable branch of its commerce with the Eastern World should be vested, by a close monopoly, in an insignificant number of individuals, to the exclusion of all the rest of their countrymen? and, also, whether it is desirable, that, in consequence of this monopoly, Englishmen should be placed on a worse footing than foreigners of every other nation; and be debarred from trading with China, or settling in India, while all other men may do both freely, and amass fortunes in a commerce from which our embarrassed merchants and starving manufacturers are entirely excluded? Let the question be proposed in what form it may, this is the sum and substance of it; and if a regard to the welfare of the many be suffered to take precedence of the interests of the few, there can be no doubt that this question must be answered in the negative."—*Oriental Herald.*

The lectures delivered by Mr. Buckingham, at the Music hall, Bold-street, on the 12th, 14th, 16th, and 17th instant, comprised so many topics of interest and national importance, that it is particularly desirable to convey to the public at large as ample a report of their substance as possible. It is, obviously, impossible to do any thing like justice to the subject in a newspaper, even by the sacrifice of every other topic; and under this conviction we have resolved to give a much more detailed and ample analysis of the course than any which has yet appeared, or is likely to appear, unless Mr. Buckingham publishes the lectures himself, which, we trust, he will do at no distant period.

Independent of the great importance of that portion of this gentleman's dissertations which relate to the East India Company's charter, and the immense advantages which would accrue to the nation from a free trade to India and China, the course contained a most interesting and entertaining narrative of the manners, customs, and superstitious rites of different Eastern nations; interspersed with so much information respecting the nature of the country, climate, and natural productions, capabilities, &c., that a perusal even of an abridgment will afford great pleasure to those who read it, without any reference to the great object of rendering these fine, but neglected, countries subservient to the interests of the British nation.

With respect to the main question, a most unaccountable indifference has been manifested by our leading journalists; but the defect will be amply remedied by Mr. Buckingham's *Oriental Herald*, a work which ought to be generally patronized, as it is calculated, more than all the other publications united, to open the eyes of the public to a subject of importance to every man, woman, and child in the country.

We have, for eighteen years, done all in our power to draw the public attention to this subject; and it is with pleasure we find that the attention we have unremittingly bestowed upon this much-neglected topic has given satisfaction in a distant quarter from which we could not have anticipated the complimentary notice which we subjoin. However flattering the language of our distant contemporary may be, it should be recollected that the praise has,

at least, the merit of being as unsolicited as it was unlooked for.

unlooked for.—"Some of the cleverest provincial papers, second in no degree, in the ability with which they are conducted, to the leading journals of London, have taken up the cause of India, and pleaded it in a manner equally zealous and talented, honourable to their feelings, and creditable to their understandings—the *Liverpool Mercury*, the *Leeds Mercury*, the *Manchester Guardian*, and several others: nor have they lost any ground by the space they have devoted to a subject which at least ought to interest the people of England, and which, we are confident, would do so if its merits were clearly and fully laid before them. That state of affairs is, we conceive, now approaching; and the day is not far distant in which the London press must turn its attention to the consideration of the question of the future administration of these vast and fertile dependencies of the British crown; and when its conductors can no longer plead in excuse of their own ignorance and indolence, an indifference which they, neglecting a sacred duty, have never sought to overcome."

We shall now proceed with our report of Mr. Buckingham's lectures, which will probably extend through two or three numbers of the *Kaleidoscope*.

Many of our readers, we doubt not, have participated in the gratification and advantages afforded to numerous and most respectable audiences by Mr. Buckingham's lectures at the Music-hall, on that most important and interesting subject, the Eastern world. Mr. Buckingham has travelled and seen much, and to the possession of extensive knowledge and information he adds the facility of communicating them to others, in a manner so pleasing and familiar, as greatly to enhance the gratification of those who hear him. He is evidently a gentleman of refined taste and cultivated imagination. From the immense extent and discursive nature of his subjects, it is astonishing that he could do any thing like justice to them; his materials would afford ample scope for a much more extended course of lectures, and we have no doubt that such a course would prove not only interesting and instructive to the hearers but also lucrative to the lecturer, who, with the experience he has now acquired, (this being his first attempt at public lecturing,) would be enabled to improve both the classification and treatment of his subjects. Perhaps, too, his style of delivery is rather too easy and colloquial, and might occasionally, when the dignity of his subject requires it, be more elevated. Be this as it may, his lectures have been received here with very great satisfaction and applause by a numerous and respectable audience, and we hope that the success of his experiment here will lead him to repeat it elsewhere, and thus disseminate throughout the kingdom, in the most pleasing manner, the most extensive and important information of which he is possessed. He can perform no greater good to his country or mankind than by lending his powerful aid to produce upon the public that impression which will lead to the destruction of the monstrous monopoly which has so long fettered and cramped the energies and resources of the Eastern world, and, for the advantage of a few, prevented the access of Europeans to a market almost unlimited, to the great injury and loss of both Asiatics and Europeans. But the subject is leading us beyond the bounds of a reasonable introduction, and we will, therefore, break off these remarks with the hope that Mr. Buckingham will persevere in the good work, and that success will speedily crown his efforts and those of such real friends to their country and their fellow-creatures as co-operate with him. Though, of course, much of the ground occupied by Mr. Buckingham has been gone over before by other travellers, we trust we shall need no apology for laying before our readers as complete a report of the lectures as it is in our power to give. Much of the information is new—much important—and all interesting; and instead of giving detached and unconnected fragments, it shall be our object, as far as we can accomplish it, to lay before our readers a correct and symmetrical whole. One further remark, and we have done with all we have to say by way of preface;—the applause was so frequent, that, for our own convenience, we shall not attempt to note every place where it occurred, but shall merely mention it where it was peculiarly warm and flattering.

Mr. Buckingham commenced by claiming the indulgence of his hearers, as, though, in the course of his voyages and travels to the east and the west, the north and the south, he had had ample facilities for acquiring information, he had had few opportunities of learning the art of communicating it orally to others, with ease to himself, and satisfaction to his hearers. Having, however, obtained that information relative to a most interesting and important quarter of the globe, he felt it incumbent upon him, as a moral and religious duty, to communicate to his countrymen the result of his observations on the condition and resources of the Eastern world, and he should esteem himself most happy if by so doing he could promote, in the least degree, the measures which would lead to the improvement of the one, and the amelioration of the other. He disclaimed being actuated in the most remote degree by vindictive feelings towards the East India Company, and stated that the convictions he entertained of the mischievous consequences of the monopolizing and exclusive policy of that Company, were long anterior to the period of his oppressive treatment, and were entertained and avowed by him even when he was receiving benefits from the Company. He saw the injurious effects of monopoly, both on India and Great Britain, and his feelings as a man and an Englishman would not permit him to remain silent, or refrain from lifting up his voice against it. *(Great applause.)* He then made some remarks on the travels of those who had preceded him, in ancient and modern times, and particularly Herodotus, to the emulation excited by hearing whose delightful history of Egypt and its antiquities the world owes the labours of Thucydides. Mr. Buckingham hoped that it would not be considered presumptuous in him to follow the good example set by them, in giving an account of what he had seen. In a country where precedent sanctified so much that was evil, it might surely be permitted, for once, to authorize that which was good; and he trusted that the goodness of his intentions would excuse any inefficiency in their performance. Egypt was the first country he had visited, and Egypt was in every respect peculiarly worthy of attention. No one who had read the scriptures could hear the name of Eygpt without sentiments of astonishment and awe. It was the cradle of civilization; it had brought to perfection all the arts and sciences which adorn, improve, and dignify mankind, when the rest of the world was lost in ignorance and barbarism; before Greece was civilized, Eygpt had monuments of taste and and grandeur; and it was not a little remarkable, that whilst this extremity of Africa was thus enlightened and civilized, the other inhabitants of that vast continent were sunk in that darkness and barbarism in which they remain this day. Mr. Buckingham then proceeded to describe to the country more particularly.

Egypt consists of a single valley, commencing at the sources of the Nile, as far as they have been ascertained, and extending to the sea; its average breadth is about nine miles, but in some places it is only half a mile, or even less, so that it is possible for two individuals to hold a conversation together, from one lateral extremity to the other of this celebrated country. It consists solely of the land overflowed by the Nile, and beyond this all is barrenness. In the present state of the country there is scarcely any possibility of extending the lateral boundaries of Egypt, because the whole of its fertile soil consists of the deposits of the Nile, and beyond its influence the ground is sandy, rugged, and mountainous. The Nile is, therefore, the parent of the country, and the source of all its riches. It has always been a most interesting problem, both with the ancients and moderns, to ascertain the sources of this celebrated river. The ancients, indeed, appear to have considered it a point of more interest and importance than the moderns, for they were not content with sending a single traveller, or a small party, to explore its recesses, but actually sent whole armies with that object, as in the time of Cambyses the Persian, and Alexander the Macedonian. There are various opinions on the subject; Mr. Buckingham inclines to the opinion that the Nile is a continuation of the Niger; if it be so, the river becomes still more remarkable, for it thus performs a course double the length of that of the river Amazon in America. Wherever the river has its source, it is certain that from the junction of the Nile and the Niger, they flow in one single undivided course to the sea, a distance of twelve hundred miles, without receiving the waters of a single tributary stream. The most singular circumstance, attending this remarkable river is its annual inundation. Recent researches have ascertained that the tropical rains are universal from the 10th degree of north latitude to the 10th degree south; but in this tract the clouds, intercepted by the lofty ranges of mountains called the Mountains of the Moon, pass to the northward, and Egypt presents the singular spectacle of the Nile swelling from June to September, remaining at its height for about a fortnight, and then gradually subsiding, and leaving behind it a highly-fertilized soil ready to receive the seed of the husbandman. Lakes have been judiciously formed, as reservoirs, on the banks of the river, in order to correct its irregularities by drawing off the excess when the supply of water is too great, and supplying the deficiency when it is too small, because when the inundation does not rise to a certain height, a scarcity follows, and when it rises beyond that height, the waters remain too long, and the deposit is too rank for the purpose of cultivation. The most extensive of these lakes are in the neighbourhood of Cairo. To the south-east of Cairo there are the remains of a canal of astonishing magnitude. Ancient historians record that there was formerly a canal from the Isthmus of Suez to the Nile, connecting the Red Sea with the Mediterranean.—A portion of the ruins of this magnificent work is now all that remains of it. Another ancient canal was one connecting Alexandria with the Nile, and this has been recently repaired and re-opened by the present Pacha, Mahommed Ali.

Egypt is most fertile in antiquities. In other countries the remains of a Roman camp, or some other relics of former days, excite great interest and curiosity; but in Egypt, wherever the traveller sets his foot, he beholds the most stupendous remnants of antiquity. It is impossible to convey any thing like an adequate idea of the greatness and magnificence of the remains of works of labour and art which it presents. Neither India, nor Greece, nor Rome, nor any other part of the world, can show any thing equal to the aggregate grandeur of the wonders of this country. When the French visited Egypt, under Napoleon, they thought it would be sufficient to immortalise the glory of their nation to publish an account of its antiquities, and a work was, accordingly, published, which was considered so valuable that it was presented only to Emperors and Kings, and cost £500 a volume. The first town or city which the traveller usually visits, is Alexandria. The ruins of this celebrated city extend fifteen miles in length, and seven in breadth, covering a space about twice the size of London; and yet, notwithstanding those astonishing dimensions, Alexandria was but one of the third or fourth rate cities of ancient Egypt. The principal objects of curiosity are the Needles of Cleopatra and Pompey's Pillar. The latter, as its name imports, is said to have been erected in honour of Pompey the Great, but it is maintained by some that it was erected in honour of the Emperor Severus, for having introduced a supply of corn into Alexandria at a time of scarcity. It is of purely Egyptian workmanship. The shaft is of black granite, and ninety feet high. The needles of Cleopatra were two obelisks, standing in front of the Ptolemeian Library. It was the custom to place before the Temples two obelisks, the usual height of which was 120 feet, and the breadth, at the base, fifteen feet, and thence gradually decreasing to almost a point at the top. To show the almost inconceivable powers at the disposal of the ancient Egyptians, it will be sufficient to mention an anecdote connected with one of these needles. About fifty years ago, one of them fell down, in consequence of the foundation giving way, and it was thus placed in a situation peculiarly convenient for removal, one great obstacle to the transportation of these monuments being the difficulty of getting them safely down. When the French, in Egypt, capitulated to Lord Hutchinson, his lordship insisted that all the antiquities which it had been intended to convey to France, should be given up to the British. The French seeing no alternative, were obliged to surrender them; and instead of showing a spirit of envy and rivalry, with a magnanimity that did them honour, gave their assistance to the British, in the attempt to remove this ponderous mass, in order that it might be conveyed to England. Rafts were built for the purpose of receiving it; but the united strength of the two armies was utterly unable to move it from the spot where it lay. The circumstance of this very obelisk having been conveyed down the Nile, as is can be satisfactorily proved

that it must have been, a distance of at least six hundred miles, serves to give some idea of the power possessed by the ancient Egyptians. The catacombs are excavations used formerly for the burial of the dead. The wells are most stupendous works, being excavations so extensive, as to form a city under ground. The necessity for their construction arose thus:—Alexandria, though called an Egyptian city, does not actually form a part of Egypt, that name being confined to the countries receiving the deposits of the Nile. Alexandria being perfectly independent of the Nile, these wells were excavated, and they were so capacious, that they would contain a supply of water sufficient for five years' consumption in time of drought. Canopus is a remarkable port, celebrated in the Odyssey of Homer; its baths were reputed to possess the remarkable and desirable quality of making old people young again. Sais, a city dedicated to Isis, is remarkable for having contained a temple hewn out of a single stone. It was brought from a distance of at least 500 miles. The dimensions are not given, but some idea of its magnitude may be formed from its having occupied 2000 pilots of the Nile, for three successive inundations of that river, in bringing to it the place of its destination. This is a proof of the great labour and care the Egyptians bestowed upon the temples of their Divinity; and however much they may have been mistaken in their religion, it is impossible not to honour them for the zeal which they displayed in its behalf. *Tanais* is principally remarkable as having been the spot where Moses contended with the magicians of Pharaoh, and for the magnitude of its walls. *Bubastis* near Cairo, was at one extremity of the canal, connecting the Isthmus of Suez with the Nile, and the selection of the place for cutting the canal was a great proof of the practical knowledge and science of the Egyptians. The distance is nearly sixty miles from sea to sea; they must, therefore, have had the means of ascertaining the level; for, had the Red Sea been above the Mediterranean, they must have *known* that there would have been so strong a current as to render it impossible for ships or boats to navigate the canal when excavated; and in order to obtain this object it was neccessary to select a spot where the two seas were on a level, and this their choice of a situation showed them fully capable of doing. *Heliopolis*, or the city of the Sun, is in the territory called in scripture the land of Goshen. The name of Heliopolis was given to it by the Greeks. It has two splendid obelisks, and is remarkable for having contained a college, where Pythagoras first taught his doctrine of the metempsychosis, or transmigration of souls. Very near to it stands Cairo, a city better known to travellers than any other. On the other side of the Nile stand the ruins of Memphis, a city founded in an age so remote, that it was in ruins when Alexandria, a place of great antiquity, was built. One of the remarkable features of Memphis, is the site chosen for the interment of the dead. The custom of the Egyptians, in this respect, was most judicious, and is well worthy the imitation of the moderns, in all countries. They never interred their dead in land capable of being applied to the purposes of the living. This custom was probably owing to the scanty limits of the valley of Egypt, a country so thickly peopled, that it was desirable to preserve every portion of it capable of ministering to the wants of its living inhabitants. Memphis has a desert on one side, and rich and fertile fields on the other. From the desert arise the Pyramids, those stupendous remnants of an age so remote, that, notwithstanding their magnitude and presumed importance, nothing certain is known as to their origin, or the uses to which they were applied. As is well known, the opinions on the subject are various; the most rational is, that these enormous structures, reared with such labour, and at such a vast expense, were intended for the burial place of the Kings of Egypt. They are generally mentioned as three in number, because there are only three of considerable magnitude, but in the plains around there are not fewer than fifty; their being so numerous is another argument in support of the opinion that they were intended for the burial of the dead. The three principal ones each, cover a space about equal to that occupied by Lincolns Inn Fields, London,* or Grosvenor-square. The size of the base, which is a square, is eight hundred feet each way; the elevation is equal to the breadth at the base, and the Pyramids are, therefore, twice the height of St. Paul's, in London. They are not of difficult ascent, being formed of retiring ranges of stone, gradually decreasing, so that the summit may be attained without great difficulty. The prospect from the top is the most remarkable, delightful, and extensive that can be conceived. It forms the subject of one of the Orphic hymns. Orpheus ascended the pyramid to witness the rising of the sun, and the sight gave rise to one of the most beautiful productions of antiquity. So completely is the origin of these stupendous structures buried in oblivion, that Herodotus, the father of ancient history, who lived 3000 years ago, lamented the impossibility of ascertaining it. He found that even the priests were incompetent to give any notion of the time when they were built, or for what purposes they were intended. All that is recorded is, the number of men who were employed, the number of years they were engaged, and the quantity of food which they consumed. That they were tombs, and not temples, there are many reasons to believe. They abound in mummies; the present population of England is not greater than that of the Necropolis, or City of the Dead. The dimensions of the Sphynx are still more enormous than those of the pyramids. The height from the chin to the lips of the statue is thirty feet; and from this may be gathered some idea of the dimensions of the whole figure. Owing to the great increase of the sands of the desert in that part, the greater portion of the enormous figure is buried; but an Italian captain, some time ago, having spent five or six months in removing the sand, a great part of the figure was disinterred, and it was found to be of such immense dimensions, that it held between its paws like a plaything, a temple capable of containing 100 persons; in this were found, in different compartments, remains of the ibis, the quail, and other birds. In the neighbourhood of Memphis is a reservoir, extending 150 miles in circumference, excavated by the Egyptians, who, with their usual prescience, thinking it probable that posterity would not credit that so stupendous an excavation had been the work of man, left a monument of the fact by erecting a pyramid in the centre, which, when the waters were let into the lake, stood 400 feet below the surface, and 400 feet above it. On this occasion many thousands of men were employed for a great number of years in the prosecution of so vast a work. In the lower part of the pyramid was formed a labyrinth, and priests were deputed to attend to the mysteries of their religion; the sacred crocodiles were deposited here; numbers of these animals have been dug up, some so large as twenty feet, others in chests, containing fifty or one hundred of them, some as small as one's finger, for these creatures are smaller when born, compared to the size they afterwards attain, than any other animal. Another remarkable city, of which there are some stupendous remains, is that of Antinoë; the remains of these cities prove that, in architecture, as well as in other arts and sciences, the ancient Egyptians were as superior to the Greeks as the Greeks were to the people of other countries. The Parthenon, and other monuments of Grecian art, are certainly extremely beautiful; but when a man passes on to Egypt, and views its splendid ruins, he is compelled to give the palm to those of that country. It is not possible to express the feelings which fill the mind of him who contemplates them. M. Dinon, the keeper of the Louvre at Paris, exclaimed, on beholding the ruins of Antinoë, that had he been a Pagan, and asked who were the founders of such a city, he must have answered that it was the work of Gods, and not of men. The remains of Hermopolis are very splendid and magnificent. Of these M. Dinon said, that had all the soldiers in the French army been artists, and had they all been constantly employed for twelve months, they would scarcely have been able to make drawings of all that remained of Hermopolis. Crocodilopolis is another ancient city, of which there are stupendous remains. It was dedicated to the sacred crocodiles, to which creatures the Egyptians paid divine honours. It contained a pharos, or lighthouse, to assist boats in the passage of the Nile, a river of peculiarly difficult navigation; yet this appears to have been the only lighthouse upon it. The Egyptians, however, were by no means a maritime people; they had, indeed, a horror of navigation, in consequence of their belief that those who perished at sea were eternally lost, in consequence of their not receiving the rites of sepulture, which they esteemed requisite to their happiness in a future state. The city of Hermopolis, previously named, contains a temple, 350 yards in length, and of the same height; on the gateway of which, half the height of this edifice, stands a village of about 100 houses, capable of lodging very comfortably 4 or 500 inhabitants. On Philoë, a small island about a mile in breadth, to which the Latin poet Juvenal was banished, on account of his satires, the Egyptians appear to have lavished their wonderful resources of power and art. They have here formed what are termed cataracts, a name, however, somewhat improperly given, as the fall of water is seldom more than five or six feet. The works on this island are a beautiful illustration of the power of art, for though, on close examination, they are found to be full of the most discordant irregularities, the impression they produce is that of perfect symmetry and order. The ornaments and buildings remaining of Elephantina bear a remarkable similarity to a city of the same name in India. Mr. Buckingham declined, however, to enter into a dissertation on the analogy observable between the buildings, manners, worship, &c. of the ancient Egyptians and the inhabitants of the East Indies.

(To be continued.)

* To those who have not been in London, it may be necessary to state, that, according to our own impression, Lincoln's Inn Fields would contain within it all the squares of Liverpool.

Correspondence.

A FEW THOUGHTS ON THE LIMITATION OF UNIVERSAL KNOWLEDGE, WITH A NEW GEOLOGICAL THEORY.

TO THE EDITOR.

SIR,—The wisdom of an omniscient and all-powerful Creator has endowed man with the ennobling faculty of reason; but, at the same time, it has been wisely ordained that *universal knowledge* should be withheld from him. "Knowledge is power," and power taken in its full signification must never be in the possession of man.

The only natural and philosophical knowledge which mankind enjoy has been derived from mere hypothesis, which may be exemplified thus:—A supposition being formed in the mind, the reasoning powers are then called into action, and if the previously-formed hypothesis be conformable to the dictates of *reason*, it is then firmly established in the mind, and becomes *knowledge*; but, on the contrary, if it be not in harmony with reason, it is but a mere chimera, which will soon pass away, or be held only in the memory of mankind as an unsubstantial idea. *Knowledge is infinite.* The wisdom of man, compared with universal knowledge, bears not even so near a proportion as the smallest drop of water does to the ocean. How many centuries have elapsed in the attainment of that trivial and almost indefinable knowledge which now exists amongst mankind! What are all the wonderful discoveries, the noble inventions, that have ever been unfolded, or manifested, since the formation of man?—what are they to those undiscovered?—to those which lie for ever hidden from the conception of man?

The various opinions concerning the form of the earth, some thousands of years ago, were wild and numerous. Some, it is well known, supposed the earth flat, and supported underneath by pillars; and others conjectured in a still more ludicrous and improbable manner: but that theory which ascribed to the earth a spherical form being consistent with reason, was, thereby, confirmed and fully established. Equally various and fanciful are the theories which now engage the attention of the learned relative to the interior of the earth.

Professor Leslie is a learned man and an able philosopher; his theory is generally received; his abilities, which are of no mean order, having made it appear consistent; but I do not coincide with him in filling the interior or cavernous part of the earth with light; neither do I consider the earth solid throughout. My opinions on the subject are briefly these:—that the earth, like the body of man, requires constant motion and animation in all its parts, both internal and external, each co-operating and connected with each other:—that the interior of the earth contains water, which has communication with that on the exterior, and, like unto the blood of man, is kept in constant action, or circulation. We perceive that all the large rivers on the earth have their rise from some spring, which ascends from the interior, and thence flowing on, along the surface of the earth, into the ocean, where it is again connected with the water in the interior. Thus a constant and regular circulation (if that term may be applied) is carried on throughout the internal and external parts of the earth. We find that by digging a certain depth into the ground, we invariably come to water:—could that be the case if the interior of the earth contains such a dry subtle substance as fire or light?

It is not now my intention to offer any elaborate hypothesis as to the precise places where the water on the sur-

ace has communication with the interior; suffice it for the present to say, that it is as likely to be in some of the unfathomable parts of the Atlantic as at the Poles. There are whirlpools also, for instance, that of Maelstroom, which I consider nothing more than an aperture into the interior; and not being so deep as the other parts of the ocean, the surface of the water becomes more affected. It is also well known, that in crossing the Atlantic and other seas, if even so great a weight, as a large millstone, were to be let down from a small boat, the current, considerably below the surface, is so violent that it would drag the millstone, together with the boat, forward with great impetuosity, thereby clearly demonstrating the flux of the water into the interior of the earth.

Next week I may probably resume the subject, and, in the meantime, leave what I have hitherto stated to the serious perusal and consideration of the readers of the *Kaleidoscope*.

A MODERN PLATONIAN.

FEATS OF STRENGTH.

TO THE EDITOR.

SIR,—I observed in your last number a letter, containing some remarks respecting the accuracy of one of the Sketches in "Mountain Dew," stating that most of the feats of strength said to have been performed by John Hyslop, of Glenmannow, properly appertained to Thomas Moffat, of Muirbrock.

The public may, perhaps, think the whole "a moonshine matter;" but I am inclined to think, that the writer of the aforesaid letter has been misinformed, and that the sketch of Glenmannow is drawn as faithfully as any thing of the kind can be "from tradition's undoubted mouth." After comparing the histories of "Old Dibbin," "Glenmannow," "Jock Huxton," and several other articles of Mr. Bennett's, in the *Dumfries Magazine*, with the accounts given by old people, who knew some of these worthies, I am led to believe that Mr. B. does not embellish at the expense of truth; and as he was brought up within a short distance of Glenmannow, he must certainly have had the anecdotes from the most authentic sources. Should the last number of the *Kaleidoscope* reach the *Free Press* office, Glasgow, it is probable that he may speak for himself.

Being myself a native of the upper part of that romantic district, called the Glenkens, and having lived about thirty years within a few miles of the residences of these modern Sampsons, I have often been amused at hearing their exploits recounted at the "ingle cheek," and I always heard the feats of "Glenmannow" described as substantially the same as recorded by his biographer, who, by the bye, has the merit of rescuing the histories of several singular individuals from oblivion.

The story of Muirbrock's carrying his horse is the same as that I used to hear told, but that of his throwing the stone is a little different. I used to hear it said, that when he was desired to give it a throw, he went to the spot to where it had been tossed, and lifting it up in his left hand, came back to the place from which it was to be thrown, pitching it up, and catching it in his hand all the way, seemingly with as much ease as a boy would pitch a ball, and that he tossed it four or five yards farther than it had been done by the most dexterous of the athletic group. I never heard that he kneeled when he threw it. I once witnessed a feat of that description performed by Baillie W. Candlish, of New Galloway, who threw a stone farther when kneeling, than his competitors, and, I believe, than he himself could when standing; but as he was not remarkable for bodily strength, it was believed that he had some peculiar knack in tossing it off.

Your correspondent is correct in stating that the circumstance of the "Eagle and Child" happened at Loch Doon; but it must have happened at least eighty years since. It was told to me by an aged relative upwards of twenty-six years ago, who said that it occurred when she was a little girl. She stated it to have taken place at the time of hay-making, and that the child was asleep, and wrapt up in a plaid. I have frequently heard of Mr. M'Turk, of Barholm, and family, and have seen some of the latter, none of whom are above forty years of age, which leads me to conclude that it may have been a child of some one of their *forebears*. Be this as it may, the circumstance has evidently been the basis of the leading tale in "Mountain Dew," and it is generally said to have been written by Professor Wilson, the supposed editor of *Blackwood's Magazine*.

I had intended to give you an account of a feat or two of strength, which has never yet appeared in print, but as I am, perhaps, intruding on your columns, I shall reserve them for another communication.—Yours, &c.

Hope-street, Jan. 15, 1829. P. MACKINNELL.

EXTRAORDINARY EXHIBITION.

Some of our readers may probably have heard of Mr. Pemberton, who has been described by many of our most judicious critics and judges of dramatic excellence, in terms of the highest panegyric. This gentleman has been, for some time past, delivering lectures and recitations of a most interesting and unique description, and requiring the varied powers of the actor, the declaimer, and the poet; and as he has arrived in Liverpool within the last few days, and will make his first appearance on Wednesday evening next, at the Lyceum Lecture-room, Bold-street, we take this opportunity of apprising our readers of the intellectual treat which awaits them. The lecture will be delivered GRATUITOUSLY.

It is no slight evidence of this gentleman's extraordinary endowments, that he should have been most warmly eulogized by the acute and experienced conductor of the *New Monthly Magazine*, who, in the publication of September, has favoured the public with some very able and well-written comments upon Mr. Pemberton's extraordinary display of high and varied talents. Of his Shylock he says, "It was, altogether, more deeply toned than any performance of the character we can call to mind; less varied and pointed than Kean's, but more intense in its sorrow, and more terrible in its revenge." Speaking of his Virginius, the same critic says,—"His main effect was produced in the scene where Virginius stabs his beloved daughter to preserve her from the grasp of the ravisher. His haggard gaze of despair, when suddenly bereft of all hope by the defeat of his faint-hearted friends, and surrounded by the guards of the Decemvir;—the deadly glare of his eyes, and sudden convulsion of his frame when he sees the knife, and instantly perceives the use to which it must be applied, and the maze of horror in which he inflicts the fatal wound;—the moment for which he stands stupidly gazing at the bloody instrument, and his fearful awakening to the sense of that revenge for which alone he is to live—were as appalling as any of the mortal horrors which people our darkest remembrances of tragic acting. In the last act, his distraction was conceived in the true spirit of poetry, and finely executed;—his attack on Appius was almost too frightful."

The article from which we have made these brief selections is of considerable length; and when the character of the *New Monthly Magazine* is borne in mind, such high commendation affords most unequivocal evidence of the extraordinary talents and capabilities of Mr. Pemberton.

To convey some idea of the nature of this gentleman's "delineations of passion and character, and illustrations of poetic imagery, description, and incident," we shall here transcribe a portion of an outline of one of the series of his performances.

Part 1.—The Thoughts, Emotions, and Sentiments, and the imagined condition arising from Reflections on Mary Queen of Scots, at Fotheringhay, the evening previous to her execution, will be embodied and individualized. Also, the Emotions of Cromwell, as looking on the Body of Charles I. with a characteristic Soliloquy.

Part 2.—Notices of the Influence of Passion and Emotion on the Voice; the irresistible effect of a natural adaptation of quality or character of its tones on an audience:—exemplified and illustrated by Passages from Shylock, Hamlet, Hotspur, Richard III., Macbeth, &c.

Part 3.—Mr. Pemberton's Humorous and Satirical Introduction to the family of Mr. B; Conversational Intelligence of Mr. B. and Mrs. B.; Musical Fascination of Miss B.; Ventriloquial Dialogue between Mr. and Mrs. B. and Anthony, the Nigger; and prodigious precocity of Oratorical Skill in Master B., &c. &c.

Mathematical Department.

(Continued from page 228.)

MATHEMATICAL CORRESPONDENCE.

57. *By Mr. J. Campbell.*—Find two numbers, such, that the sum of their squares shall be equal to the difference of their cubes, and the difference of their squares equal to their product.

58. *By Mr. W. Slade.*—A lever is a feet long, and weight w; a weight equal to w is suspended from one end; find the place of the fulcrum, that there may be an equilibrium.

59. *By Mr. J. Pritchard.*—A globe of fir, of one foot in diameter, is balanced in air by a ball of iron of the same weight; how will the equilibrium be affected when the bodies are weighed in vacuo? and what weight of wood, properly disposed, will then be required to restore the equilibrium?

60. *By Mr. J. Baines.*—On what day of the year, in latitude 52 deg. 14 sec. 19 min. N., is the sun's altitude 30 deg., at the middle of the time between sunrise and noon?

61. *By Mr. J. Baines.*—Find a triangular number, such, that its double, increased by unity, shall also be a triangular number.

62. *By Mr. J. Pritchard.*—A twenty-four pounder cast-iron shot descends in water by the force of gravity; determine the greatest velocity it can acquire, and the time of describing 100 feet from rest.

Solutions (postage paid) directed to the Committee of the Mathematical Society, left at No. 4, Whitemill-street, Liverpool, will meet with proper attention.

EDITORIAL APPROPRIATIONS.—If an original article of one editor is worthy of adoption by another, one would conclude it was worth acknowledging also. In looking over the last *Examiner*, our attention was arrested by a paragraph on a subject, the title of which was very familiar to us. It was given as from the *Liverpool Chronicle*, although it formed part of an original editorial article of considerable length published in the *Mercury* of the 26th of December, from which, with proper acknowledgment of the source from which it was derived, it was copied entire into the *Morning Chronicle*, *Globe*, and several other papers. How the *Examiner* came to ascribe it to another Liverpool paper, we cannot even surmise. The article to which we allude was entitled, "Is the Earth a Solid, or Hollow and Cavernous?—Professor Leslie's Theory—Other Speculations—Captain Symme's Theory of Open Poles,"—given at full length also in the *Kaleidoscope*.

To Correspondents.

SUTTER.—We shall next week insert in the *Kaleidoscope* an interesting letter from *An Eye Witness*, which appeared in the last number of the *Oriental Herald*.

IRISH SCENERY.—No. XII. of this agreeable original series is in reserve for our next.

MUSIC.—We have to acknowledge a chant by *J. C.*

CHESTER FANCY BALL.—A correspondent informs us that the verses on this subject, which we last week copied as from a Chester paper, with the substitution of Chester for Winchester, appeared originally in the *New Monthly Magazine*.

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